

### REMARKS

Claim 36 is being cancelled without prejudice, Claim 45 is being added. Claims 1-2, 7-10, 37-38 and 43 are being amended. Upon entry of this amendment claims 1-23 and 37-45 will be pending in the application.

The amendment to claim 1 is supported by the specification at, for example, page 11.

The amendment to claim 2 is supported by the specification at, for example, page 20.

The amendment to claim 8 adding "without a reinforcing agent" is supported by the specification at, for example, page 11 and Example 8. The remaining amendment to claim 8 is supported by that claim as filed.

The amendment to claims 9 and 10 is supported by those claims as filed.

The amendment to claim 37 is supported by that claim as filed.

The amendment to claim 38 is supported by the specification at, for example, pages 11 and 12.

The amendment to claim 43 is supported by the specification at, for example, page 11.

The amendment to claim 44 changes dependency.

New claim 45 is supported by as filed claim 1.

The claim amendment and new claim add no new matter.

**The rejection of claims 1-5, 7-13, 19-23 and 36-44 under 35 U.S.C. §102(b) over U.S. Patent No. 6,087,467 to Marrocco III et al.**

Claims 1-5, 7-13, 19-23 and 36-44 were rejected under 35 U.S.C. §102(b) as having each and every feature and interrelationship anticipated by U.S. Patent No. 6,087,467 to Marrocco III et al.

- Requirements for a legally sufficient rejection under 35 U.S.C. §102(b).

The legal burden for a proper rejection under 35 U.S.C. §102 is clear. “It is axiomatic that for prior art to anticipate under §102 it has to meet every element of the claimed invention.” Hybritech Inc. v. Monoclonal Antibodies, Inc., 213 USPQ 81 (Fed. Cir. 1986); Stoller v. Ford Motor Co., 18 USPQ2d 1545, 1547 (Fed. Cir. 1991). The omission of any claimed element no matter how insubstantial is grounds for traversing a rejection based on Section 102. Connell v. Sears Roebuck & Co., 772 F.2d 1542 (Fed. Cir. 1983).

- Applicant’s claims are directed to orthodontic components.

All of Applicant’s present claims are directed and limited to an orthodontic component. The Office communication admits that the pending claims are directed to an orthodontic component.

- The Marrocco reference does not disclose orthodontic components or use of the materials therein for orthodontic applications.

A computer search of the Marrocco reference did NOT find the word “orthodontic” used therein. The Marrocco reference does not teach or suggest orthodontic components or use of the materials therein for orthodontic applications.

- The Office communication admits that the Marrocco reference does not disclose each element of the rejected claims.

The Office communication admits at page 2, paragraph 2 that the Marrocco reference does not disclose, teach or suggest orthodontic components or orthodontic applications.

- The Marrocco reference does not inherently anticipate Applicant’s claims.

The Office communication admits that the Marrocco reference does not disclose, teach or suggest orthodontic components or orthodontic applications and tries to

overcome this fatal deficiency by stating that, with underling added: “. . . the polymer [of Marrocco] is inherently capable of being used as claimed . . .”.

When the PTO asserts that there is an explicit or implicit teaching or suggestion in the prior art, it must indicate where such a teaching or suggestion appears in the reference. In re Yates, 211 USPQ 1149, 1151 (CCPA 1981). However, the Office communication fails to indicate where in the Marrocco reference support for this speculative statement can be found as required by In re Yates.

Further, the Office communication statement fails to comply with the requirements of inherent anticipation. “The fact that a certain result or characteristic may occur or be present in the prior art is not sufficient to establish the inherency of that result or characteristic.” See MPEP 2112. To rely on the theory of inherency in rejecting a claim under 35 U.S.C. 102 or 103, “. . . the examiner must provide a basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic necessarily flows from the teachings of the applied art.” (emphasis in original). Ex parte Levy, 17 USPQ2d 1461, 1464 (Bd. Pat. App. & Inter. 1990). Anticipation by inherent disclosure is appropriate only when the reference discloses prior art that must necessarily include the unstated limitation. Atofina v. Great Lakes Chem. Corp., 441 F.3d 991, 1000 (Fed. Cir. 2006) citing Transclean Corp. v. Bridgwood Servs., Inc., 290 F.3d 1364, 1373 (Fed. Cir. 2002). “To establish inherency, the extrinsic evidence 'must make clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill. Inherency, however, may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient.” In re Robertson, 169 F.3d 743, 745, 49 USPQ2d 1949, 1950-51 (Fed. Cir. 1999) (citations omitted).

The Office communication position that the Marrocco reference is devoid of any teaching or suggestion of orthodontic components but that orthodontic components must “necessarily be included” in that reference as required for inherent anticipation is not logical or legally supportable.

The rejection of claims 1-5, 7-13, 19-23 and 36-44 under 35 U.S.C. §102(b) as having each and every feature and interrelationship anticipated by U.S. Patent No. 6,087,467 to Marrocco III et al. is legally unsupportable under relevant jurisprudence. Applicant respectfully traverses this rejection of claims 1-5, 7-13, 19-23 and 36-44 and asserts that it should be withdrawn. Claims 1-5, 7-13, 19-23 and 36-44 are patentable over the Marrocco reference for at least this reason.

**The rejection of claims 1-7 under 35 U.S.C. §102(b) over U.S. Patent No. 4,717,341 to A. Jon Goldberg et al.**

Claims 1-7 were rejected under 35 U.S.C. §102(b) as having each and every feature and interrelationship anticipated by U.S. Patent No. 4,717,341 to A. Jon Goldberg et al.

- The Goldberg reference does not disclose all of the features of claim 1.

For the reasons discussed in the previous Response Applicant respectfully disagrees with the Examiner's assertion that the Goldberg reference discloses a rigid backbone polymer as that term is used in Applicant's specification. However, to move this application forward claim 1 has been amended to recite that the rigid backbone polymer at least partially comprises a first arylene or heteroarylene moiety joined to a second arylene or heteroarylene moiety by a covalent bond between adjoining ring carbon atoms of the arylene or heteroarylene moieties. As discussed in more detail in the previous Response the features recited in amended claim 1 are not taught or suggested by the Goldberg reference.

The rejection of claims 1-7 under 35 U.S.C. §102(b) as having each and every feature and interrelationship anticipated by U.S. Patent No. 4,717,341 to A. Jon Goldberg et al. is legally unsupportable under relevant jurisprudence. Claims 1-7 are patentable over the Goldberg reference for at least this reason.

- Amended claim 2 is patentable for additional reasons.

Amended claim 2 recites: "The orthodontic component of claim 1, wherein . . . the component has isotropic properties.

The Goldberg reference is directed to a polymer matrix reinforced with fibers. The reinforcing fibers provide the resulting composite with anisotropic properties. In fact, these anisotropic properties are an important feature of the Goldberg material. See column 8, lines 50-54. The Goldberg reference does not teach a material having isotropic properties.

Amended claim 2 is not anticipated by U.S. Patent No. 4,717,341 to Goldberg et al. and is patentable for at least this additional reason.

- New claim 45 is patentable for additional reasons.

New claim 45 recites: "The orthodontic component of claim 1 wherein the rigid backbone polymer comprises at least one of a compatibilizing side group or a solubilizing side group."

The Goldberg reference discloses a number of polymers suitable for use in the reinforced composite system therein. As discussed in the previous Response there is no teaching or suggestion in the Goldberg reference concerning the use of compatibilizing or solubilizing side groups in the polymer backbone.

New claim 45 is not anticipated by U.S. Patent No. 4,717,341 to Goldberg et al. and is patentable for at least this additional reason.

**The rejection of claims 6 and 14-18 under 35 U.S.C. §103(a) over U.S. Patent No. 6,087,467 to Marrocco III et al in view of U.S. Patent No. 4,717,341 to Goldberg et al.**

Claims 6 and 14-18 were rejected under 35 U.S.C. §103(a) as being obvious over U.S. Patent No. 6,087,467 to Marrocco III et al. in view of U.S. Patent No.

4,717,341 to Goldberg et al. Claim 6 depends directly from claim 1 while claims 14-18 depend directly from claim 8.

- Requirements for a legally sufficient rejection under 35 U.S.C. §103.

As stated in MPEP §2143, to establish a *prima facie* case of obviousness three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or combine the reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. When even one claim limitation is not found in the combination of prior art, a rejection under 35 U.S.C. §103 is improper. In re Royka, 490 F.2d 981, 180 USPQ 580 (CCPA 1974).

- The Office communication incorrectly interprets the Goldberg reference.

The Office communication asserts “Goldberg et al. teach a rigid backbone polymer . . .” As explained above the Goldberg reference does not teach or suggest a “rigid backbone polymer” as that term is defined in Applicant’s specification or recited in amended claim 1.

- There is no suggestion or motivation to combine the Marrocco and Goldberg references.

As discussed above Further, the Marrocco and Goldberg references are directed to different systems.

#### **Goldberg reference**

The Goldberg reference is directed only to an orthodontic system.

#### **Marrocco reference**

The Office communication admits that the Marrocco reference does not disclose orthodontic components or orthodontic applications.

### **Goldberg reference**

The Goldberg reference is directed only to fiber reinforced composites ("FRC"). The Goldberg teaches that non-fiber reinforced polymers that are indicated to not be suitable for orthodontic use. See for example column 3, lines 62-68.

The required fiber reinforcement of the Goldberg material makes that material anisotropic (the Goldberg material will have different mechanical properties in different axes due to orientation of the reinforcing fibers). This is indicated to be an important feature. See column 8, lines 50-54.

Mechanical properties of the Goldberg material are strongly influenced by the fiber reinforcement and to a lesser extent by shape.

It is difficult to change part configuration along the length of that part in the Goldberg material due to the required fiber reinforcement.

The disclosed FRC materials start with low stiffness and increase stiffness by adding more reinforcing fibers.

In sum, the Goldberg reference is directed to use of only fiber reinforced polymer composites and only for orthodontic systems while the Marrocco reference is generally directed to use of non-fiber reinforced polymers and does not disclose orthodontic components or orthodontic applications.

### **Marrocco reference**

The Marrocco reference generally stresses the advantages of the disclosed non-fiber reinforced polymers over fiber reinforced polymer composites. See background therein. The Marrocco reference does disclose fiber reinforcement for a few selected applications.

The Marrocco material does not require fiber reinforcement and may therefore be isotropic (the Marrocco material may have substantially the same mechanical properties in all axes).

Mechanic properties of the Marrocco material are strongly influenced by shape as there may be no fiber reinforcement.

The Marrocco material can change configuration along length as there may be no fiber reinforcement.

The disclosed material has inherent mechanical properties without reinforcing fibers.

There is no suggestion or motivation to make the modifications proposed in this rejection. Claims 6 and 14-18 are not obvious over U.S. Patent No. 6,087,467 to

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Attorney Docket: UCON/204/US

Marrocco III et al. in view of U.S. Patent No. 4,717,341 to Goldberg et al. and are patentable for at least this reason.

- Claims 14-18 are patentable for additional reasons.

Claims 14-18 depend directly from claim 8. Amended claim 8 recites in part: "An orthodontic component, comprising a thermoplastic polymer and without a reinforcing agent . . ."

The Goldberg reference teaches that fiber reinforcement is necessary. See, for example, the Abstract thereof. The reinforcing fibers provide the resulting composite with anisotropic properties. In fact, these anisotropic properties are an important feature of the Goldberg material. See column 8, lines 50-54.

In sum, the Goldberg reference requires reinforcing fibers to provide important anisotropic properties. Amended claim 8, and claims 14-18 depending therefrom exclude the presence of reinforcing agent.

If proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification. MPEP 2143.01, Rev. 2 May 2004, pp. 2100-131. Any proposed modification to the Goldberg reference excluding reinforcing fibers would eliminate the important anisotropic features of that reference. Amended claim 8 and claims 14-18 depending therefrom, can not be obvious over the Goldberg reference.

Claims 14-18 are not obvious over U.S. Patent No. 4,717,341 to Goldberg et al. and are patentable for at least this additional reason.

**The rejection of claims 8-14, 16-17 and 19-23 under 35 U.S.C. §103(a) over U.S. Patent No. 4,717,341 to A. Jon Goldberg et al.**

Claims 8-14, 16-17 and 19-23 were rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 4,717,341 to A. Jon Goldberg et al.



- The cited references do not teach or suggest all of the features of Applicant's claims 8-14, 16-17 and 19-23.

Claims 9-14, 16-17 and 19-23 depend directly from claim 8. Amended claim 8 recites in part: "An orthodontic component, comprising a thermoplastic polymer and without a reinforcing agent . . ."

As discussed above the Goldberg reference does not teach or suggest an orthodontic component comprising a thermoplastic polymer without a reinforcing agent. In fact, the Goldberg reference requires at least 5 percent by weight of a reinforcing agent. See, for example, column 5, lines 20-24. One disclosure of an unreinforced polymer in the Goldberg reference teaches that such unreinforced polymers are not suitable for orthodontic use. See column 3, lines 62-68.

In sum, the Goldberg reference requires reinforcing fibers to provide important anisotropic properties. Amended claim 8, and claims 9-14, 16-17 and 19-23 depending therefrom exclude the presence of reinforcing agent.

Claims 8-14, 16-17 and 19-23 are not obvious over U.S. Patent No. 4,717,341 to Goldberg et al. and are patentable for at least this reason.

- Claim 22 is patentable for additional reasons.

Claim 22 recites: "The orthodontic component of claim 8, consisting essentially of the thermoplastic polymer." The transitional phrase "consisting essentially of" limits the scope of a claim to the specified materials or steps "and those that do not materially affect the basic and novel characteristic(s)" of the claimed invention. MPEP §2111.03 citing In re Herz, 537 F.2d 549, 551-52, 190 USPQ 461, 463 (CCPA 1976)

The Goldberg reference teaches that fiber reinforcement materially affects the resulting composite. Thus, fiber reinforcement would be excluded from the orthodontic component recited in claim 22 by use of the transitional phrase "consisting essentially of".

Claim 22 is not obvious over U.S. Patent No. 4,717,341 to Goldberg et al. and are patentable for at least this additional reason.

- Claim 23 is patentable for additional reasons.

Claim 23 recites: "The orthodontic component of claim 8, wherein the thermoplastic polymer is in the form of a coating over at least part of a core." The Office communication does not discuss the features recited in claim 23 or indicate where or how these features may be divined from the Goldberg reference. In fact, the Office communication dated 10/13/2005 at page 5, paragraph 10 explicitly admits that the Goldberg reference does not show a coating over at least part of a core.

Claim 23 is not obvious over U.S. Patent No. 4,717,341 to Goldberg et al. and are patentable for at least this additional reason.

**The rejection of claims 15 and 18 under 35 U.S.C. §103(a).**

Claims 15 and 18 were rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 4,717,341 to A. Jon Goldberg et al. in view of U.S. Patent No. 5,174,753 to Wool.

Claims 15 and 18 depend directly from claim 8. As discussed above the Goldberg reference does not teach or suggest an orthodontic component comprising a thermoplastic polymer without a reinforcing agent. The Wool reference is similarly deficient in teaching or suggesting these properties. Claims 15 and 18 are not obvious over the Goldberg reference in view of the Wool reference and are patentable for at least this reason.

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In summary, Applicants have addressed each of the objections and rejections within the present Office Action. It is believed the application now stands in condition for allowance, and prompt favorable action thereon is respectfully solicited.

The Examiner is invited to telephone Applicant's attorney if it is deemed that a telephone conversation will hasten prosecution of this application.

Respectfully submitted,

Artie J. Goldberg et al

Date: 7-19-2006  
750 Main Street- Suite 1400  
Hartford, CT 06103-2721  
(860) 527-9211

By:   
James E. Piotrowski  
Registration No. 43,860  
Alix, Yale & Ristas, LLP  
Attorney for Applicants

\\Alix-pw3hy3s5je\AYR\AYR saved docs\Filing Docs\UCON\Ucon204us106 resp.doc